Welcome

The EMS Enterprise Framework for BUILDER Version 3.0 is the newest product in the family of Engineered Management Systems (EMS) under development by the U.S. Army Corps of Engineers at its Engineering Research and Development Center-Construction Engineering Research Laboratory (ERDC-CERL) in Champaign, IL. The new framework provides web-based access to the latest version of BUILDER, an automated tool to support engineering and facility management decisions regarding when, where, and how best to maintain buildings and their key components.

In keeping with the EMS design philosophy, BUILDER uses as its primary condition measure a condition index (CI) rating on a 0-to-100 point scale. The condition index for each component-section is computed from inspection data that records the type, severity, and density of each distress found. Deterioration curves developed from experience over time show the optimal point at which work should be done to avoid more costly rehabilitation projects later.

New to the EMS Enterprise Framework is the functionality index (FI). The FI is the primary functionality measure and uses a 0-to-100 point scale to keep with the EMS design philosophy. The functionality index is computed from assessment data that records the functionality issues present in the building and the severity and density of those issues. Based on the assessment data, building modernization requirements can be identified.

With the assistance of the IMPACT simulation engine included with the EMS Enterprise Framework, managers can develop long-range work plans based on a sound investment strategy. By providing an objective description of condition and an automated means of exploring various options under different budget scenarios, BUILDER and IMPACT together make multi-year work plans easier to formulate and funding requests easier to justify. The goal is optimal facility performance for the dollars invested.

While the EMS Enterprise Framework is being developed for military installations, it is applicable for any organization with facility management responsibilities. The University of Illinois has several Cooperative Research and Development Agreements with ERDC-CERL to transfer EMS technology to the public works community.

Developed by U.S. Army ERDC-CERL

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What's New in Builder 3.0

There are a variety of new features and program improvements in the upgrade from BUILDER 2.2 to 3.0. These enhancements have been addressed to improve user interface and advance the science of building asset management. A list of the most significant enhancements is provided below.

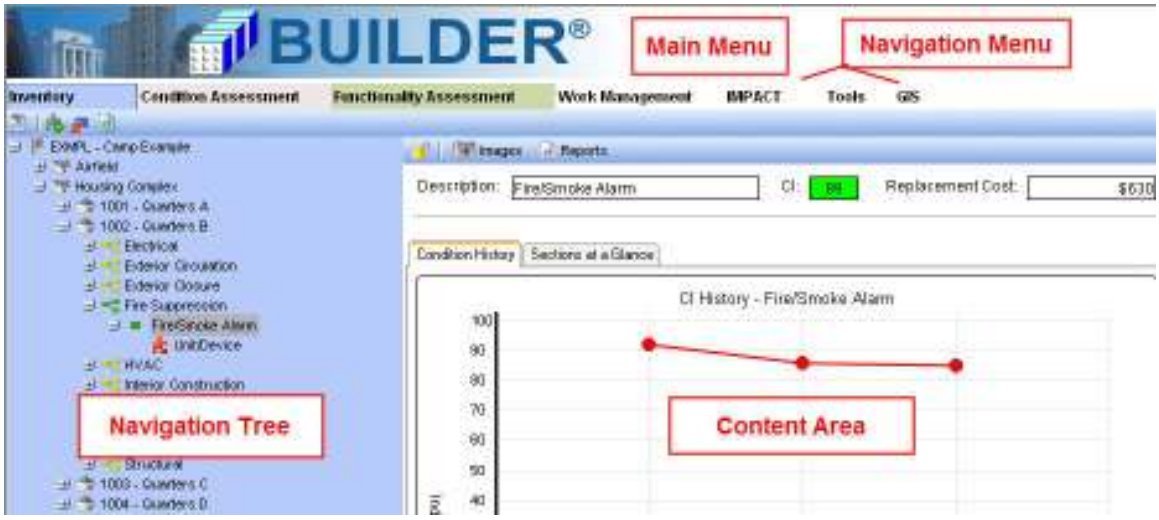
- **Web-Based Access**. Starting with version 3.0, BUILDER will be a web-based program instead of a locally installed desktop software program. The main advantage of the web-based program is that it allows everyone in your work group with a valid username and password access to your database from anywhere with an active internet connection. This allows for multiple employees with the appropriate permissions at different locations the ability to access your facility-related data.
- **Knowledge-Based Inspection Scheduling**. Knowledge-Based Inspection Scheduling is an automated tool designed to select from the vast array of asset inventory a subset of component-sections that should be considered for inclusion in the next round of inspections. The selection algorithm is based on life-cycle attribute knowledge associated with each component section that is compared with user-defined parameters to schedule condition assessments. Incorporates US Patent # 7,058,544.
- **Functionality Assessments**. Functionality Assessments measure the building's inherent capability to meet user requirements efficiently within limits of code and compliance. The assessments are performed using a three-tiered, top-down approach to narrow the focus and provide greater assessment detail to the identified problem issues. The three tiers are the building as a whole, functional area, and component-section. In BUILDER 3.0, functionality assessments can be performed at the first and second tiers, or building and functional area levels. Later versions will include the third tier, or component-section level, functionality assessments. Incorporates US Patent App # 11,194,655.
- **Functionality Index (FI)**. After a functionality assessment has been performed, a FI will be computed based on the results. If the assessment is performed at the building-level, the Building Functionality Index (BFI) will be computed. If the assessment is performed at the functional area level, the Functional Area Functionality Index (FAFI) will be computed. The scale of the FI is conceptually similar to the existing CI for condition, and provides an objective measure of suitability for a given mission. Incorporates US Patent App # 11/194,655.
- **Building Functional Areas**. Before the second tier of functionality assessments can be performed, functional areas must be created in buildings. Functional areas describe the use and classification of different building spaces. BUILDER version 3.0 allows for the creation of functional areas and the ability to assign existing inventory in the building to the functional areas. This allows the building to be partitioned into different functional uses which may be managed individually.
- **Building Performance Index (BPI)**. The BPI is building-level metric that measures the overall performance of buildings. It is weighted combination of the Building Condition Index (BCI) and the BFI. The BPI can be rolled up to the complex, site, and group level using the average BPI's, weighted by replacement cost, to obtain the Complex, Site, or Group performance index (PI).

- **Work Item Cost Analysis**. To determine the most cost-effective work activity for work items in BUILDER 3.0, the Work Item Cost Analysis tool can be used. The automated tool determines the return and return-on-investment (ROI) for each work activity type (do nothing, stop gap repair, repair, and replace). Different work activities in different work years can be explored, and the most cost-effective options can be selected. Incorporates US Patent App # 11/223,251.
- **Integration of IMPACT into BUILDER**. In previous versions, the IMPACT application was a separate, stand-alone program from the BUILDER program. In version 3.0, IMPACT is integrated into the web-based version of BUILDER. The inclusion of IMPACT with the BUILDER application improves ease of use and increases efficiency in exploring long range work plans.
- **Scenario Analysis**. To compare the results of multiple IMPACT scenarios, the scenario analysis tool has been added to version 3.0. Specifically, the condition trends and the expensed & backlogged reports of multiple IMPACT scenarios can be compared side-by-side. From these comparisons, the goal of optimal facility condition for the dollars invested can be met.
- **Component Importance Index**. The Component Importance Index (CII) is a measure that conveys the relative importance of a building component asset on a 0 to 1 scale. It allows users to view condition, schedule inspections, and prioritize work for their most critical building assets.

Getting Started

Navigating BUILDER 3.0

After opening the BUILDER website and logging into BUILDER 3.0, a screen similar to the one shown below will appear:



The BUILDER user interface has four (4) main areas, each of which is described in greater detail below:

- Main Menu
- Navigation Menu
- Navigation Tree
- Content Area

Main Menu

The Main Menu has two (2) options:

- **Logout**. This option allows the current user to logout, or sign-off, of BUILDER. Once logging out of BUILDER, you will no longer be able to view or edit data until logging back in.
- **Help**. This option launches a context-sensitive help file pertaining to the current BUILDER screen.

Navigation Menu

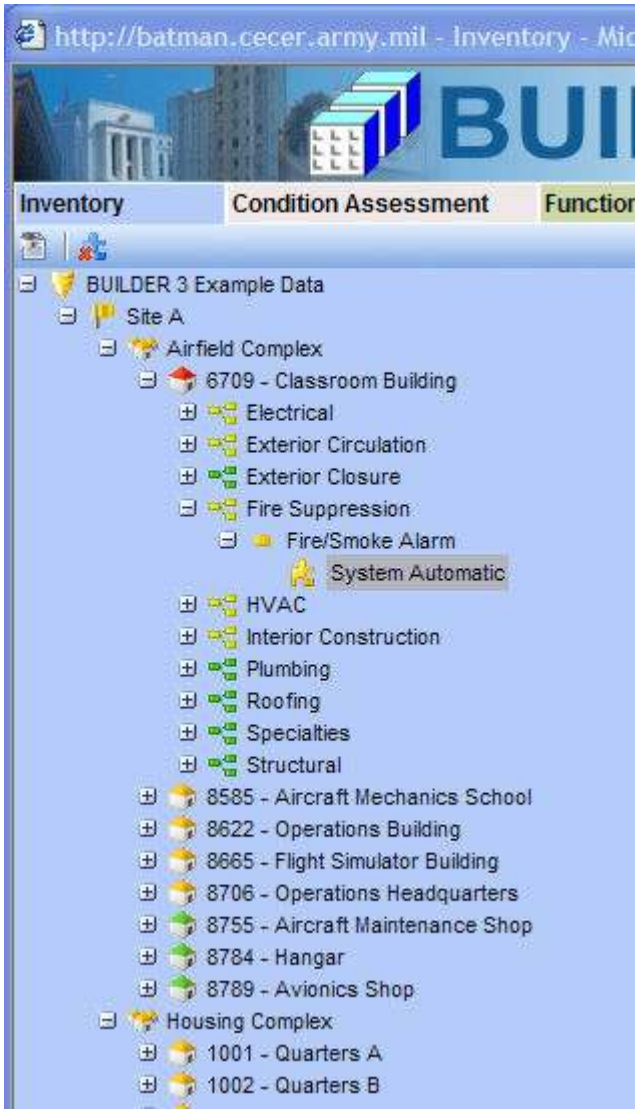
The Navigation Menu has six (6) options:

- **Inventory**. Clicking on the Inventory option will bring up in the inventory tree in the navigation tree. After an inventory level is chosen in the tree, placing the mouse over the Inventory option will cause a sub-menu to drop-down providing you with additional inventory options for the selected level. See the Inventory Overview for more information.

- **Condition Assessment**. Clicking on the Condition Assessment option will bring up in the condition assessment tree in the navigation tree. After a condition assessment level is chosen in the tree, placing the mouse over the Condition Assessment option will cause a sub-menu to drop-down providing you with additional condition assessment options for the selected level. See the Condition Assessment Overview for more information.
- **Functionality Assessment**. Clicking on the Functionality Assessment option will bring up in the functionality assessment tree in the navigation tree. After a functionality assessment level is chosen in the tree, placing the mouse over the Functionality Assessment option will cause a sub-menu to drop-down providing you with additional functionality assessment options for the selected level. See the Functionality Assessment Overview for more information.
- **Work Management**. Clicking on the Work Management option will cause a sub-menu to drop down providing you with the work management options for Standards & Policies, Funding, Prioritization, and the Work Plan.
- **Scenarios**. Clicking on the Scenario option will bring up the Scenarios Management Window, where users can create, Manage and Analyze different scenarios.
- **Tools**. Clicking on the Tools option will cause a sub-menu to drop down providing you with tools for importing data (from BRED, NFADB, and other systems), administration (User Preferences, Application Settings, Security, and Manual Condition Roll-Up), libraries (Cost, Inflation, and Service Life), Reports, and GIS.

Navigation Tree

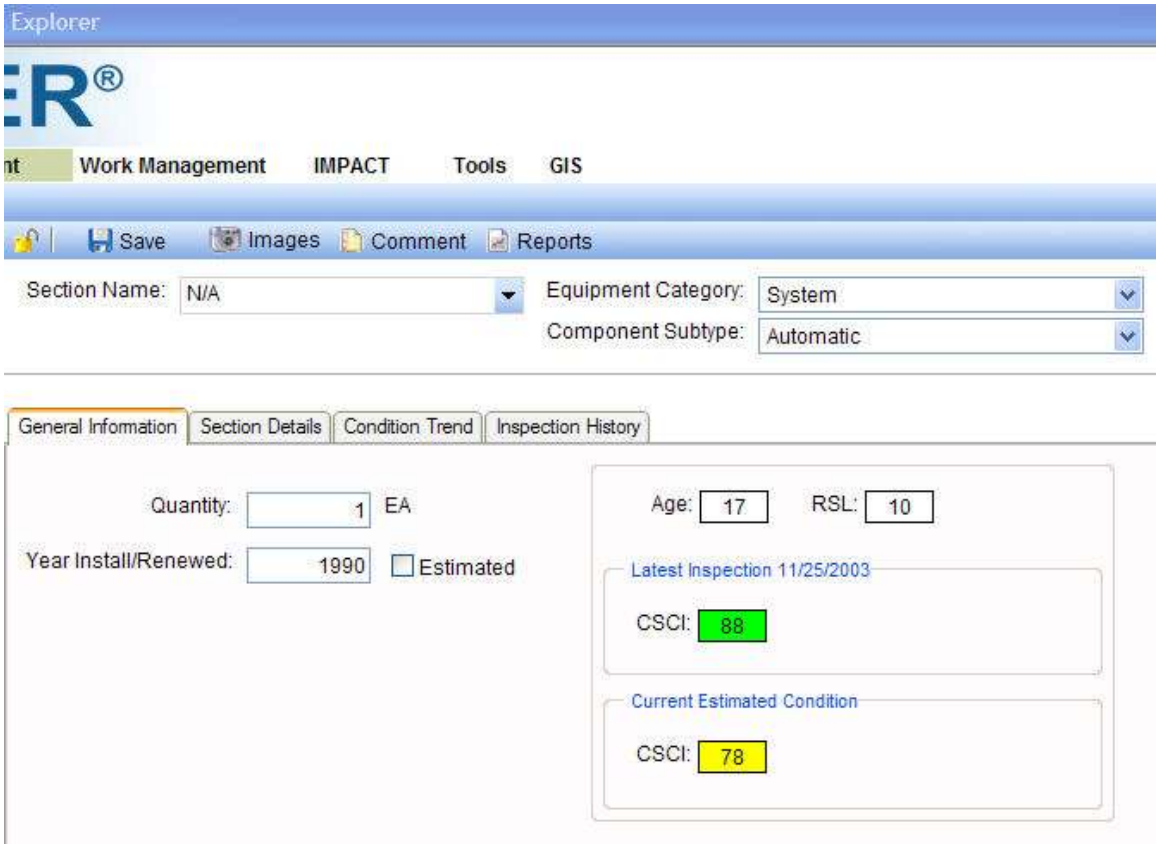
The Navigation Tree allows you to select the different levels of the tree and to view data related to the level in the context area. Shown below is an example of the inventory tree.



Here, the tree can be expanded by clicking on the "+" next to an inventory level or collapsed by clicking on the "-" next to an inventory level. To select a particular inventory level, left or right-click on it. The information pertaining to that inventory level will be displayed in the content area. While the example described above is for the inventory tree, the condition assessment and functionality assessment trees are navigated in the same manner.

Content Area

The content area displays the specific information pertaining to the current item selected in the navigation tree. Shown below is an example of what would appear in the content area if a component-section was selected in the inventory navigation tree. If you wish to view information pertaining to a different item, navigate the tree to the item and select it by clicking on it.



Recognizing the Common Icons

Listed below are the common command, toolbar, and menu buttons, along with their definitions, you will encounter when using BUILDER. It is a good idea to become familiar with these icons before using the program.

- - CLOSE. Click this button to close an open window.
- - SAVE. Click this button to permanently save and store changes to the data.
- - CANCEL. Click this button to cancel changes that have been made to the data since the last save. Changes made to data on the screen are not stored in the database until the SAVE button is clicked. Clicking CANCEL will cause recent changes to the data on the screen to be overwritten by data from the database.
- - NEW/ADD. Click this button to create a new record. The type of record to be created is determined by where the NEW button is located. For example, if the button is next to a dropdown list, clicking the NEW button will create a new entry in that list. If the button is above a grid, clicking the NEW button will create a new line in the grid, i.e. a new record of whatever is being displayed in the grid. If the NEW button is in the window toolbar, clicking it will create a new item of the type being displayed in the window.
- - DELETE. Click this button to delete a selected record. The record to be deleted is determined by where the DELETE button is located. For example, if

the button is next to a dropdown list, clicking the DELETE button will delete the record identified by the current selection in the list. If the button is above a grid, clicking the DELETE button will delete the current selected record in the grid (designated by an arrow in the left most column). If the DELETE button is in the window toolbar, clicking it will delete the item being viewed in the window and generally close the window since no data will then be available for display.

- - COPY. Click this button to copy a selected item.
- - COMMENT. Click this button if you wish to record a comment. The scope of the comment is determined by the location of the button. A COMMENT button in the window toolbar is used for comments regarding the item displayed in the window. A COMMENT button next to a dropdown list allows you to add comments about the current item selected in the list.
- - IMAGES. Click this button if you wish to add a image. The scope of the image is determined by the location of the button. A IMAGE button in the window toolbar is used for images of the item displayed in the window.
- - REPORTS. Click this button to select and view standard reports. The types and scope of the reports are determined by where the REPORTS button is located. A REPORTS button in the window toolbar is used for reports of the item displayed in the window.
- - LOCKED RECORD. This indicates whether the selected record is locked or not. If it is locked, the record cannot be edited. This may be the case either because the record is checked out or the user does not have permission.

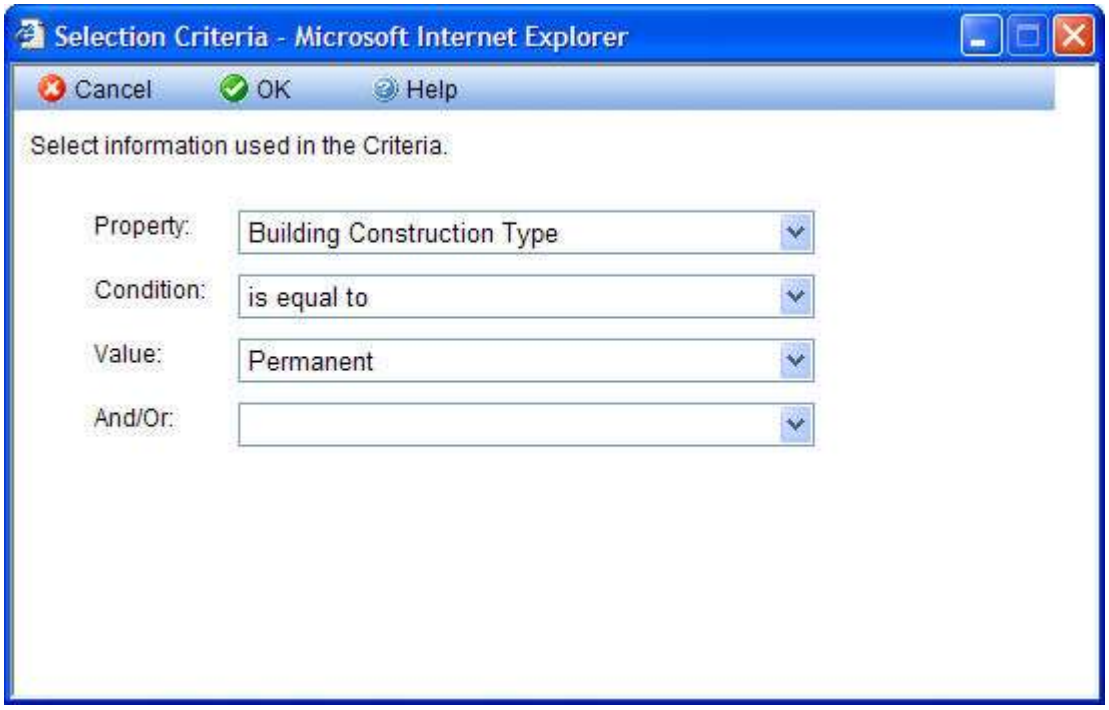
Establishing Selection Criteria

Several features of BUILDER, including GIS themes and funding sources, require that you specify a criteria that will be used in deciding whether or not a building, component-section, or work item belongs to a particular group. Each instance where you must establish a selection criteria presents you with a grid similar to the one shown below:

A selection criteria constructed in this grid has been designed to be easily read. If you are familiar with SQL selection statements used with database management systems, the structure and wording of the criteria in the grid should look familiar. Each row of the grid represents one full statement in the criteria. Each statement is connected to the others by "And" or "Or". The association of statements is from the left, i.e. "A and B or C" is actually "(A and B) or C."

Creating a New Selection Criteria

To create a new selection criteria, click the ADD button in the top right corner of the Selection Criteria tab. The Selection Criteria Info window will appear:



Select the property to be used in the criteria from the Property dropdown list. Once the property is selected, the Condition dropdown list will populate with appropriate condition statements. Select a condition from the list. Depending on the property, the Value may be either entered or selected from a dropdown list of available choices. Finally, if more than one selection criteria will be used, Select the proper connecter ("And" or "Or") statement. Click the OK button to save the selection criteria. If you do not wish to create the selection criteria, click the CANCEL button.

Important Points:

1. It is possible to create selection criteria containing contrary statements. BUILDER has no way of determining this but will simply return no items satisfying it.
2. Condition Index (CI) properties of all inventory items use -1 as the value of the CI when the CI is unknown. If you use a statement such as "CI is less than X," then you should also add a statement "CI is greater than or equal to 0" so as not to include all of the items of unknown CI.

Editing an Existing Selection Criteria

If you wish to edit an existing selection criteria, click the selection criteria in the grid and click the EDIT button in the top right corner of the tab. Again, the Selection Criteria Info window will open and the property, condition, value, and connector statement can be edited.

Deleting an Existing Selection Criteria

If you wish to delete an existing selection criteria, click the selection criteria in the grid and click the DELETE button in the top right corner of the tab.